LISTING OF CLAIMS

Claims 1-25 (canceled).

26. (Previously presented) A method according to claim 37, wherein the physical feature is calculated by curve fitting the measured differential backscatter signal to a backscatter function, in which the backscatter function is a function of a mean free path of photons.

27. (Currently amended) The method according to claim 26, wherein the backscatter function (R_{bs}) is defined by:

$$R_{bs}(\lambda) = C_{app}^{'} \cdot p(\lambda,180) \cdot \mu_s(\lambda) \cdot \exp(-2 \cdot mfp(\lambda)) \cdot \sum_{i=1}^{n} \rho_i \cdot \mu_a^{spec,i}(\lambda))$$

where C_{app}' is an apparatus constant, p(λ,180) is a phase function, $\mu_s(\lambda)$ is a scattering coefficient of the ~~medium~~ sample (1), λ is a wavelength of the first and second backscattered radiation, mfp(λ) is the mean free path as a function of the wavelength, n is a number of substances in the ~~medium~~ sample (1), is concentration of absorber i present in a detection volume of the sample (1), and $\mu_a^{spec,i}(\lambda)$ is an absorption coefficient of substance i as a function of the wavelength.

28. (Canceled)

29. (Currently amended) A device for determining a physical feature of a ~~medium~~ sample (1), comprising:

a light source (2) for producing radiation;

a probe with at least a first and a second optical fiber (5, 6), the first optical fiber (5) having a first diameter and being arranged to deliver the radiation on a sample (1) ~~of the medium~~ and to collect first backscattered radiation from the sample (1), the second optical fiber (6) having a second diameter and being arranged to collect second backscattered radiation, wherein the second optical fiber (6) is positioned alongside the first optical fiber (5); wherein at least one of said fibers both delivers light from the light source and measures scattered light from the sample (1);

a spectrometer (7) for producing a first signal (1) based on the first backscattered radiation, and for producing a second signal (J) based on the second backscattered radiation;

a processor (9) arranged to determine a measured differential backscatter signal as a function of wavelength (λ) using the first and second signals (I, J), wherein the processor is arranged to calculate the physical feature.

30-33. (Cancelled)

34. (Previously presented)The method according to claim 26, wherein the method further comprises the steps of:

simultaneously measuring backscatter radiation on different locations of the sample (1);

determining a physical feature for the different locations; and

calculating a standard deviation of the physical feature.

35. (Currently amended) The device according to claim 29, wherein the device is configured for ~~method further comprises the steps of~~:

simultaneously measuring backscatter radiation on different locations of the sample (1);

determining a physical feature for the different locations; and

calculating a standard deviation of the physical feature.

36. (Currently amended) The device according to claim 29, wherein the physical feature is a concentration of at least one substance in the ~~medium~~ sample (1).

37. (Currently amended) A method of determining a physical feature of a ~~medium~~ sample (1), comprising the steps of:

producing radiation with a light source (2);

placing a probe on a sample (1) ~~of the medium~~, the probe comprising a first optical fiber (5) having a first diameter, and at least a second optical fiber (6) having a second diameter;

sending light coming from the light source, through the first optical fiber;

collecting first backscattered radiation through the first optical fiber and second backscattered radiation through the second optical fiber; wherein at least one of said fibers both delivers light from the light source and measures scattered light from the sample (1);

producing a first signal (1) based on the first backscattered radiation, and a second signal (J) based on the second backscattered radiation;

determining a measured differential backscatter signal as a function of wavelength using the first and second signals (I, J); and

calculating the physical feature.

38. (Previously presented) A method according to claim 37, wherein the fibers are positioned alongside one another.

39. (Cancelled)

40. (Previously presented) The device according to claim 29, wherein the processor is arranged to calculate the physical feature by curve fitting the measured differential backscatter signal to a backscatter function (R_{bs}), wherein the backscatter function is a function of a mean free path of photons.

41. (Cancelled)

42. (New) The method according to claim 37, wherein the physical feature is calculated by curve fitting the-measured differential backscatter signal to a backscatter function, in which the backscatter function is a function of an average path-length (τ) traveled by detected scattered photons, the average path-length (τ) being independent from an absorption coefficient (μ_a) of the sample (1), and from a scattering coefficient (μ_s) of the sample.

43. (New) The method according to claim 42, wherein the average path-length (τ) is also independent from a wavelength (λ) of the first and second backscattered radiation.

44. (New) The method according to claim 42, wherein the path-length (τ) is proportional to the first fiber diameter.

45. (New) The method according to claim 42, wherein the backscatter function is given by:

$$R_{bs}=C_1 \cdot \mu_s \cdot \exp(-\tau \cdot \mu_a)$$

with $\tau=C_2 \cdot d_{fiber}$ where C_1 and C_2 are constants, μ_a is the absorption coefficient of the sample (1), μ_s is the scattering coefficient of the sample (1), and d_{fiber} is the first fiber

diameter.

46. (New) The method according to claim 45, wherein C_2 is approximately 0.6.

47. (New) The method according to claim 42, wherein the physical feature is a concentration of at least one substance in the sample (1).

48. (Withdrawn) The method according to claim 42, wherein the method further comprises the steps of:

simultaneously measuring backscatter radiation on different locations of the sample (1);

determining a physical feature for the different locations; and

calculating a standard deviation of the physical feature.